CiscoSecure ACS 2.3 for UNIX Installation Guide

Product Number DOC-CSASC2.3UX-IG=

Use this guide to install the following CiscoSecure Access Control Server (ACS) products:

- *CiscoSecure ACS 2.3 for UNIX* (CSU-2.3)— Installs a new CiscoSecure ACS 2.3 for UNIX site *without* the optional Distributed Session Manager (DSM) module licensed or enabled.
- *CiscoSecure ACS 2.3 for UNIX Distributed Session Manager* (CSU-2.3-DSM)—Installs a new CiscoSecure ACS 2.3 for UNIX site *with* the DSM module licensed and enabled.
- *CiscoSecure ACS Distributed Session Manager Option* (CSU-DSM)—Adds the licensed and enabled DSM module to an existing CiscoSecure ACS 2.3 for UNIX site.
- *CiscoSecure ACS for UNIX Upgrade to v2.3* (CSU-2.3-UG)—Upgrades an existing CiscoSecure ACS 2.x for UNIX site to version 2.3.

Table 1 lists the sections of this document:

Table 1 Sections of this Document

Section	Description
Considerations Before You Install CiscoSecure ACS, page iii	Start with this section before installing CiscoSecure ACS 2.3 for UNIX software.
Basic Installation Procedures, page iv	Read this section for the basic CiscoSecure ACS installation procedures.
Solaris 2.5.1 Patches, page xiv	Read this section if you are installing on top of Solaris 2.5.1. It describes Solaris 2.5.1 patches necessary to run CiscoSecure ACS.
Upgrading from CiscoSecure ACS 2.x to 2.3, page xiv	Read this section if you are upgrading from a previous version of CiscoSecure ACS.
Activating the DSM Module on an Existing CiscoSecure ACS 2.3, page xviii	Read this section if you are licensing and activating the DSM module on an existing or newly upgraded CiscoSecure ACS 2.3 for UNIX site that is not yet licensed or enabled to support the DSM.
Setting Up an Oracle Database for CiscoSecure, page xix	Read this section if you intend to use an Oracle database engine to support CiscoSecure ACS. It describes the preinstallation Oracle configuration requirements.
Setting Up a Sybase Enterprise SQL Server for CiscoSecure, page xxii	Read this section if you intend to use a Sybase database engine to support CiscoSecure ACS. It describes the preinstallation Sybase configuration requirements.

Table 1 Sections of this Document

Section	Description
Accessing CiscoSecure ACS 2.3 for UNIX Documentation, page xxiv	This section lists the online and printed sources of CiscoSecure documentation.
Installing without a CD-ROM, page xxv	Read this section if you intend to install CiscoSecure ACS on a workstation with no CD-ROM.
Manually Enabling Profile Cache Updating, page xxvi	Read this section if you intend to run third-party programs that directly edit the CiscoSecure profile database.
CiscoSecure System Description, page xxvi	Read this section for a basic description of how CiscoSecure ACS software works with your other network components to provide authentication, authorization, and accounting services.
Distributed Session Manager Features, page xxviii	Read this section for a basic description of the Distributed Session Manager (DSM) feature and a summary of DSM installation and post-installation requirements.
Editing Configuration Files to Enable or Disable the DSM Module, page xxx	Read this section if you want to enable DSM but do not have access to the CiscoSecure Administrator web pages.
Editing CSU.cfg to Specify a CiscoSecure Software License Key, page xxxi	Read this section if you want to specify a new or replacement software license key for CiscoSecure ACS but do not have access to the CiscoSecure Administrator web pages.
Obtaining Documentation, page xxxii	Read this section for information about Cisco documentation and additional literature.
Obtaining Technical Assistance, page xxxii	Read this section for guidelines on obtaining assistance and additional information from Cisco Systems.

Considerations Before You Install CiscoSecure ACS

Considerations Before You Install CiscoSecure ACS

Before you begin, consider the following situations and steps you must take before starting the basic installation procedures in the next section.

Table 2 Considerations Before You Install CiscoSecure ACS

Consideration	Requirements
• If you are not familiar with how CiscoSecure ACS software works	You need to acquaint yourself with the basic CiscoSecure ACS system and how it works with other network components to provide authentication, authorization, and accounting services. First read "CiscoSecure System Description," page xxvi.
• If you need general information on the optional Distributed Session Manager (DSM) product	You need to acquaint yourself with the max sessions control features that the optional Distributed Session Manager can provide. First read "Distributed Session Manager Features," page xxviii.
• If you are installing the product CiscoSecure ACS 2.3 for UNIX, which sets up a new CiscoSecure ACS site *without* a licensed or activated Distributed Session Manager (DSM) option	Start with the procedures in "Basic Installation Procedures," page iv.
• If you are installing the product *CiscoSecure ACS for UNIX Upgrade to v2.3*, which upgrades a previous version of CiscoSecure ACS to CiscoSecure ACS 2.3	You need to look up old configuration information to apply to the upgrade. First read "Upgrading from CiscoSecure ACS 2.x to 2.3," page xiv for additional instructions.

Considerations Before You Install CiscoSecure ACS

Table 2 Considerations Before You Install CiscoSecure ACS

Consideration	Requirements
• If you are installing the product *CiscoSecure ACS 2.3 for UNIX Distributed Session Manager* (DSM), which installs a new CiscoSecure ACS with the optional CiscoSecure Distributed Session Manager (DSM) module licensed and enabled	• You need to preinstall Oracle Enterprise or Sybase Enterprise software for each of your CiscoSecure ACSes. Read "Setting Up an Oracle Database for CiscoSecure," page xix or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii. • You need to obtain a special DSM-enabling software license key, run the CiscoSecure installation program, and after installation, start the CiscoSecure Administrator web pages to enable the DSM feature. Read "Basic Installation Procedures," page iv for details. • After installation, set up replication among your Oracle or Sybase profile databases. • Enable AAA accounting functions on your client NASes.
• If you are using the product, *CiscoSecure ACS Distributed Session Manager Option*, which enables the optional CiscoSecure Distributed Session Manager (DSM) module on an already existing CiscoSecure ACS 2.3 for UNIX site	• You need to have installed Oracle Enterprise or Sybase Enterprise software prior to the last installation of your CiscoSecure ACSes. Read "Setting Up an Oracle Database for CiscoSecure," page xix or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii • You need to obtain a special DSM-enabling software key and enable it through the CiscoSecure Administrator web pages. Read "Activating the DSM Module on an Existing CiscoSecure ACS 2.3," page xviii • After enabling the DSM module, set up replication among your Oracle or Sybase profile databases. • Enable AAA accounting in the client NASes.

Table 2 Considerations Before You Install CiscoSecure ACS

Consideration	Requirements
• If you plan to install more than one CiscoSecure ACS, and have your users authenticated from a common replicated profile database or • If you plan to support more than 5,000 users	You need to purchase and preinstall Oracle Enterprise or Sybase Enterprise software for each of your CiscoSecure ACSes. First read "Setting Up an Oracle Database for CiscoSecure," page xix or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii.
• If you want to download and install CiscoSecure ACS 2.3 for UNIX from the Internet	You need to follow special procedures for downloading and starting the installation package. First read "Installing without a CD-ROM," page xxv.

Basic Installation Procedures

This section describes the basic procedures for first-time installation of CiscoSecure ACS 2.3 for UNIX at most sites.

Note If you are upgrading from a previous version of CiscoSecure ACS 2.x, see "Upgrading from CiscoSecure ACS 2.x to 2.3," page xiv for additional instructions.

Check Package Contents

The CiscoSecure ACS package includes the following items:

- CD-ROM labeled *CiscoSecure ACS 2.3 for UNIX*
- Release notes (read *before* starting installation)
- *Requires Immediate Attention* form for software key
- *Cisco Information Packet*

Check System Requirements

The network components that interact with CiscoSecure ACS 2.3 for UNIX consist of:

- CiscoSecure ACS itself (a primary server installed on an Ultra 1 workstation plus an optional backup server, installed on a second Ultra 1 workstation, that can be activated if the primary unit is disabled)
- One or more client network access servers (NASes)
- Web-based console from which to manage CiscoSecure (this can be a separate workstation or the same Ultra 1 workstation where CiscoSecure ACS is installed)
- RDBMS database site and server (this can be a separate workstation or the same Ultra 1 workstation where CiscoSecure ACS is installed)
- Optional token servers

Each of these components has certain CiscoSecure configuration requirements.

CiscoSecure ACS Server Requirements

CiscoSecure ACS (and its optional backup server) requires the following hardware and software:

- Ultra 1 or compatible workstation
  - To support CiscoSecure ACS *without* the licensed Distributed Session Manager option:

    Ultra 1 with a processor speed of 167 MHz or better

    —Minimum 200 MHz if the Oracle or Sybase RDBMS is installed on the same system.
  - To support CiscoSecure ACS *with* the licensed Distributed Session Manager option:

    Ultra 1 or better

    —Ultra 10 or better if the Oracle or Sybase RDBMS is installed on the same system
- Minimum 256 MB of swap space
  - Minimum 512 MB of swap space if the Oracle or Sybase RDBMS is installed on the same system
- 128 MB of RAM
  - 256 MB of RAM if the Oracle or Sybase RDBMS is installed on the same system
- Minimum 256 MB of free disk space (if you are using the supplied SQLAnywhere database)
  - Minimum 2 GB disk space if the Oracle or Sybase RDBMS is installed on the same system
- CD-ROM drive (optional)

Note If you need to install CiscoSecure on an Ultra 1 workstation with no CD-ROM drive, you can download the CiscoSecure installation package from the Cisco Systems web page. (See “Installing without a CD-ROM,” page xxv.)

- Solaris 2.6, or Solaris 2.5.1 with patches (see “Solaris 2.5.1 Patches,” page xiv for special instructions concerning Solaris 2.5.1)

Note To check your version of Solaris, enter the Solaris command **uname -a**. If the system returns 5.5.1, Solaris 2.5.1 is installed. If the system returns 5.6, Solaris 2.6 is installed.

Note To support the RADIUS tunneling feature of CiscoSecure ACS 2.3(5), the Sun Ultra 1or compatible workstation must be running Solaris 2.6.

CiscoSecure NAS Requirements

CiscoSecure ACS works with the following network access servers (NASes):

- Cisco routers (models AS5100 through AS5800 and AS2509 through AS2512) running Cisco IOS software (Release 11.2 or later)
- Selected routers not running Cisco IOS software, running RADIUS protocols conforming to IETF RADIUS, specifically RFCs 2138 and 2139.

Note To support the RADIUS tunneling feature of CiscoSecure ACS 2.3(5), the AAA server must be running Cisco IOS Release 12.0(5)T or another vendor's NAS software that supports RADIUS tunneling attributes.

CiscoSecure Workstation Console Requirements

The web-browser-based CiscoSecure ACS workstation console requires the following hardware and software:

- Pentium 90 or faster PC, or an UltraSPARC or better workstation
- 32 MB of RAM on a PC
- SVGA display with resolution of 1024 x 768 or higher
- Minimum 1 MB of video RAM (2 MB recommended)
- 17-inch or larger monitor recommended
- One of the following web browsers:
  - Netscape Communicator (version 4.5, 4.51, 4.6, 4.61, or 4.7 on Windows 95 or NT; version 4.5, 4.51, 4.6, 4.61, or 4.7 on Solaris 2.5.1 or 2.6)
  - Internet Explorer (version 4.01 or 5.0 on Windows 95 or NT)

Note The browser must be enabled for Java and Java Script.

Database Installation Requirements

To support CiscoSecure database requirements, you can use either the supplied SQLAnywhere database engine or supported versions of your own preinstalled Oracle Enterprise or Sybase Enterprise software running on your network.

Supported database engines include:

- The supplied *SQLAnywhere* database—Does not require preinstallation on the network; but be aware of the limitations of the SQLAnywhere database option:
  - *Does not* support networks of more than 5,000 users
  - *Does not* support database replication
  - *Does not* support the CiscoSecure Distributed Session Manager (DSM) feature (which requires CiscoSecure database replication setup)

  If your network requires these support features, Cisco recommends preinstalling the Oracle Enterprise or Sybase Enterprise database engine.
- *Oracle Enterprise* version 7.3.2, 7.3.3, 7.3.4, or 8.0.x. (Version 7.33 or higher is required for database replication and DSM support. Version 7.3.4 requires two scripts to be run for replication. See the User Guide for more information)—Requires preinstallation and configuration. It must be running during CiscoSecure ACS installation. See "Setting Up an Oracle Database for CiscoSecure," page xix, for instructions on configuring this software to support CiscoSecure ACS.

  Note If you intend to set up CiscoSecure with Oracle database replication, Cisco recommends that you read the PDF document *Using CiscoSecure with Oracle's Distributed Database Feature* (filename csbsdoc.pdf) before you install the Oracle or CiscoSecure software. This document is located in the *$BASEDIR*/FastAdmin/docs directory of the CiscoSecure distribution CD-ROM. It provides an easy-to-understand, start-to-finish, screen-by-screen configuration example of setting up Oracle database replication to work with CiscoSecure.
- *Sybase Enterprise* version 11.0.2 or higher—Requires preinstallation and configuration. It must be running during the CiscoSecure installation. See "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii for instructions on configuring this software to support the CiscoSecure ACS.

Token Servers Installed (If You Are Supporting Them)

If you are supporting token servers, they must be installed on the network *before* you install CiscoSecure ACS. Supported token servers include:

- CRYPTOCard
- Secure Computing
- Security Dynamics, Inc.

Obtain a CiscoSecure Software License Key

Note If you are upgrading from a previous version of CiscoSecure 2.x, see "Upgrading from CiscoSecure ACS 2.x to 2.3," page xiv for instructions on using your old software license key.

If you are installing CiscoSecure ACS for the first time on this Ultra 1 workstation:

Step 1 At the Ultra 1 workstation where you want to install CiscoSecure ACS, enter the **hostid** command to obtain the host ID of the system host. For example:

```
# /usr/ucb/hostid
55412315
```

Step 2 Note the host ID for the primary and backup CiscoSecure ACS systems.

Step 3 Note the token code on the label attached to the form *Requires Immediate Attention: Software License Keys*.

Step 4 Follow the instructions on the form to obtain your license key.

Note Software license keys issued to install CiscoSecure with the Distributed Session Manager (DSM) option will consist of 28 hexadecimal characters. Software license keys issued for CiscoSecure ACS 2.3 for UNIX *without* the DSM option will consist of 20 hexadecimal characters.

Step 5 When you get the license key, transcribe it into the blank for **Enter the AAA Server License Key**, in the step **Prepare Your Answers to the Installation Questions**.

Note The CiscoSecure ACS software is licensed per server. Each CiscoSecure ACS requires its own license. You can also use a backup server license to allow sites to run redundant systems to back up system security and accounting information.

Prepare Your Answers to the Installation Questions

The questions you will be asked during the CiscoSecure ACS installation are similar to those below.

Note Save these answers for both *installation* and *post-installation* configuration.

- Is this a completely new installation (Y/N)? _____

  The answer is **Yes** unless you have installed a previous version of CiscoSecure ACS (2.x) and want to use the same database information.

- Enter the directory name where CiscoSecure will be installed.

  _____

  Minimum disk space requirement is 120 MB.

- IP Address to use for CiscoSecure. _____

  The default is the primary IP address of the server on which you are installing the CiscoSecure ACS. For single server installation, use the default; otherwise, specify the address of the first ACS.

- **Enter the AAA Server License Key.** _____

  Specify the software license key code that you received from Cisco.

- If the host name of this server is not the same as its fully qualified domain name (FQDN), enter the FQDN. _____

  Specify the FQDN of the Ultra 1 workstation where you are installing the ACS *only if the FQDN is different* from the host name; otherwise, accept the default (host name) value for this prompt.

- Enter the TACACS+ NAS name you will be using. _____

  To support TACACS+ enabled NAS(es), either specify the host name of one such NAS, or indicate that any NAS with a specified TACACS+ secret key will be using CiscoSecure ACS.

  When you run the install program, pressing **Enter** for this prompt's default selection, **none**, supports any NAS with a specified TACACS+ secret key.

- Enter the TACACS+ NAS secret key. _____

  If you intend to support TACACS+ enabled NAS(es), specify a secret TACACS+ key string.

- Select the token card(s) to use or **none**: (1. CRYPTOCard, 2. Secure Computing, 3. Security Dynamics, Inc.) _____

  If you want to support one of the listed Token Cards, specify the card you want to support.

  Note Selecting Security Dynamics, Inc. requires that the SDI client software be properly installed before the ACS is started.

  – [If Secure Computing] Do you want to use CiscoSecure's SafeWord GUI Software (Y/N)? _____

    This feature requires local root read/write file access to the SafeWord directory.

  – [If Secure Computing] Enter the directory path for the SafeWord Software. _____

    Enable SafeWord's IMPORT/EXPORT option in the Secure Computing SafeWord application program.

  – [If Secure Computing] Enter the IP address of the Secure Computing server. _____

- Choose a Database: (1. SQLAnywhere, 2. Oracle Enterprise, 3. Sybase Enterprise) _____

  Specify the database for AAA data. SQLAnywhere is the default choice and is supplied with CiscoSecure ACS. Oracle Enterprise or Sybase Enterprise support require that those products already be installed and accessible on your network during CiscoSecure installation.

Caution The SQLAnywhere database engine *does not* support networks of more than 5,000 users, *does not* support database replication, and *does not* support the maximum session limitation feature of the optional CiscoSecure Distributed Session Manager feature. If your network requires these support features, Cisco recommends preinstalling the Oracle Enterprise or Sybase Enterprise database engine.

  - If SQLAnywhere, the directory where you want the database files to be created. _____

    This directory requires disk space of 256 MB.
  - If Sybase or Oracle, the username and password to the DB account that has been assigned database space for the CiscoSecure ACS data. _____
  - If Oracle, the path to the $ORACLE_HOME directory, where Oracle is installed. _____
  - If Oracle, the TNS Service name of the Oracle server. _____
  - If Sybase [Enterprise], the name of the Sybase SQL server. _____
  - If Sybase [Enterprise], the name of the database to use for CiscoSecure. _____
  - If Sybase [Enterprise], the path to the $SYBASE directory where Sybase is installed. _____

- If not a New Install, do you want to drop and re-init existing Database Tables (Y/N)? _____

  If this is not a new installation, specify whether you want to remove the existing tables in the database and create new ones.

Caution Dropping existing tables will delete all existing CiscoSecure ACS data. Existing ACS data will not be carried over to new tables.

- Enter an available TCP/IP port to be reserved for the CiscoSecure database server process. _____

  The default port is 9900. Unless you know that port 9900 is used by another process, specify the default.
- Enter a unique name for the CiscoSecure DB server process. _____

  Specify any unique string. The default value is CSdbServer.
- Enter the directory path to use for AAA server profile caching. _____

If no directory is specified, the root directory of the system will be used for profile caching.

Install and Start CiscoSecure ACS

Step 1 Log in as [Root] at the Ultra 1 workstation where you want to install CiscoSecure ACS.

Note Remember, if you are using the Oracle Enterprise or Sybase Enterprise product as your database engine, that database product must be installed, configured, and running *before* you start the install procedures described in this section. If you have not already done so, see "Setting Up an Oracle Database for CiscoSecure," page xix, or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii, for details.

Step 2 Insert the CD-ROM labeled "CiscoSecure ACS 2.3 for UNIX" and enter:

```
pkgadd -d /cdrom/csus_23 CSCEacs
```

The installer displays the first of a series of installation prompts:

```
Is this a completely new install Y/N (Default yes, q to quit)?
```

Note If you install CiscoSecure using a link defined in the root directory pointing to the actual CiscoSecure base directory, a warning message might appear indicating there is not enough space in root to install CiscoSecure. If you know that there is sufficient space in the linked directory to install CiscoSecure, ignore this message and press **Y** at the prompt to continue the CiscoSecure installation.

Step 3 Complete the installation using the preinstallation information that you recorded in the "Prepare Your Answers to the Installation Questions" section on page ix. After installation is complete, the system displays:

```
Installation of CSCEacs was successful.
```

Step 4 Start CiscoSecure ACS. Enter:

```
# /etc/rc2.d/S80CiscoSecure
```

If You Licensed and Installed CiscoSecure with DSM, Enable DSM

If you installed the Distributed Session Manager module using the product labeled *CiscoSecure ACS 2.3 for UNIX Distributed Session Manager*, log in to the CiscoSecure Administrator web site and enable the DSM module as follows:

Note If you did *not* install CiscoSecure ACS with the Distributed Session Manager option, skip this section. Go to "What's Next," page xiv.

After starting CiscoSecure ACS, access the CiscoSecure Administrator web site to perform some initial configuration:

Note If you do not have access to the CiscoSecure Administrator web site, you can enable the DSM module by carefully editing the CSU.cfg and CSConfig.ini files. See "Editing Configuration Files to Enable or Disable the DSM Module," page xxx.

Step 1 From a Windows 95 or Windows NT workstation, start your Netscape Navigator or Microsoft Internet Explorer web browser and enter the following URL:

`http://`*`your_server`*`/cs`

where *your_server* is the host name (or the fully qualified domain name, FDQN, if host name and FDQN differ) of the Ultra 1 workstation where you installed CiscoSecure ACS. You can also substitute the Ultra 1 workstation's IP address for *your_server.*

Note If the security socket layer feature on your browser is enabled, specify "https" rather than "http" as the hypertext transmission protocol. Enter: **https://***your_server*/**cs**

Step 2 When the CiscoSecure Logon window appears, enter the superuser name and password and click **Submit**. The default superuser name and password in a new CiscoSecure ACS installation are:

```
username: superuser
password: changeme
```

Step 3 In the CiscoSecure Administrator web site menu bar, click **AAA** and then click **General**.

Step 4 In the AAA > General web page locate the Max Sessions Enabled field and select the **Distributed** option. This is the option that enables the full set of Distributed Session Manager features on CiscoSecure ACS.

Step 5 For this setting to take effect, you must stop and restart CiscoSecure ACS.

- Log in as [Root] to the Ultra 1 workstation where you installed CiscoSecure ACS. To stop CiscoSecure ACS, enter:

  # /etc/rc0.d/K80CiscoSecure

- To restart CiscoSecure ACS, enter:

  # /etc/rc2.d/S80CiscoSecure

Step 6 Confirm that Oracle or Sybase database replication is set up and enabled between your CiscoSecure database sites. For details, see the chapter "Setting Up Database Replication Among CiscoSecure ACSes" in the *CiscoSecure ACS 2.3 for UNIX User Guide*.

Step 7 Confirm that AAA accounting functions are enabled on all client NASes. For details, see the chapter "CiscoSecure ACS Accounting" in the *CiscoSecure ACS 2.3 for UNIX User Guide*.

What's Next

The *CiscoSecure ACS 2.3 for UNIX User Guide* provides information about what to do next.

- If you are using CiscoSecure ACS for the first time, go to the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Configuring Initial Test Group and User Profiles" for a tutorial on setting up an initial test user profile.
- If you are familiar with earlier versions of CiscoSecure, go to the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Introduction to the CiscoSecure Software" for a listing of new CiscoSecure ACS features.
- If you are upgrading from CiscoSecure Version 1.0*x*, go to the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Converting an Existing AA Database to a CiscoSecure ACS 2.3 Database."
- If you have installed and enabled the CiscoSecure DSM module

  OR

- If you want to set up Oracle or Sybase database replication for any other reason:

  Assign a DBA-level Oracle or Sybase administrator to set up replication support for CiscoSecure. Database Replication instructions are included in the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Setting Up Database Replication Among CiscoSecure ACSes."

For a list of the documentation available, see "Accessing CiscoSecure ACS 2.3 for UNIX Documentation," page xxiv.

Solaris 2.5.1 Patches

Ultra 1 workstations running Solaris 2.5.1 require the following Solaris patches to support CiscoSecure ACS 2.3:

- 103566-25 (or a later version of this patch)
- 106529-04 (or a later version of this patch)
- 106255-01 (or a later version of this patch)
- 103640-17 (or later version of this patch)

These patches or their latest versions can be downloaded from:

`http://sunsolve.sun.com`

README files for each patch are also available at this site.

Note You will require a SunSpectrum support contract to obtain some or all of the above mentioned patches.

You can use the Solaris **showrev -p** command to determine what Solaris patches are already installed on the system.

Upgrading from CiscoSecure ACS 2.x to 2.3

The product labeled *CiscoSecure ACS Upgrade to v2.3* upgrades previous versions of CiscoSecure 2.x for UNIX to CiscoSecure ACS 2.3 for UNIX *without* the Distributed Session Manager (DSM) module enabled. If you are upgrading from CiscoSecure ACS 2.x, complete the following steps:

Upgrading from CiscoSecure ACS 2.x to 2.3

Note If you want CiscoSecure ACS 2.3 for UNIX *with* the DSM module installed, *first* follow this procedure to upgrade to version 2.3. *Then* use the *CiscoSecure ACS Distributed Session Manager Option* product to license and enable the DSM module. To support DSM, make sure that an Oracle or Sybase RDBMS is installed for CiscoSecure prior to running the CiscoSecure upgrade installation program. For details, see "Setting Up an Oracle Database for CiscoSecure" section on page xix or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure" section on page xxii.

Step 1 Before you start the upgrade installation, read the file *$BASEDIR*/config/CSU.cfg and write down the software key value for use during installation.

$BASEDIR is the install directory for CiscoSecure that you specified at the time of installation. For example, if you specified "ciscosecure" as the install location, the file is located at /ciscosecure/config/CSU.cfg. Below is an example of the line in the CSU.cfg file that contains the software key value:

```
LIST config_license_key = {"a9505ad08a77f927afa4"};
```

Step 2 Prepare your CiscoSecure ACS 2.x database for upgrade to ACS 2.3 format:

- **Back up your CiscoSecure ACS 2.x database.**
- Export all the accounting records to an external file by running the AcctExport utility.

If you are upgrading from CiscoSecure 2.x, the CiscoSecure ACS installation will implement database schema changes for version 2.3 compatibility. These schema changes include recreating a profile data table (cs_profile) as well as an accounting data table (cs_accounting_log).

Step 3 (Optional) If you want to preserve your old debug level, TACACS+ NAS configurations, and supported authentication methods settings for the ACS, save the current *$BASEDIR*/config/CSU.cfg file to a holding directory.

Step 4 (Optional) If you want to preserve your old unknown_user default profile settings, save the current *$BASEDI*R/config/DefaultProfile file to a holding directory.

Step 5 Remove the current version of CiscoSecure ACS from the Ultra 1 workstation. Log in as [Root] and enter:

```
pkgrm CSCEacs
```

Step 6 Install CiscoSecure ACS 2.3 for UNIX following the procedures described in the "Basic Installation Procedures," page iv.

Note However, skip the section "Obtain a CiscoSecure Software License Key." You do not need to obtain a new software license key to upgrade from a previous version of CiscoSecure ACS 2.x for UNIX to CiscoSecure ACS 2.3 for UNIX.

Upgrading from CiscoSecure ACS 2.x to 2.3

Step 7 During installation, enter your old software license key (either primary or backup) when prompted by the installer and complete the installation.

Note If you did not enter the software key value at the time of installation, you can specify it after installation in the CiscoSecure License Key field in the CiscoSecure ACS AAA General web page.

Note Depending on the number of user profiles existing in the CiscoSecure ACS database, the database upgrade phase of CiscoSecure installation could take some time. Conversion time is approximately 5 minutes for every 10,000 user profiles.

Step 8 If the CiscoSecure installation procedure fails during the database upgrade phase due to a fixable condition (such as database resources errors):

a. Fix the condition that caused the failure.

Note If the failed upgrade was for a Sybase Enterprise database from CiscoSecure ACS 2.0 format to CiscoSecure ACS 2.3 format, you must manually update the database schema. See "If CiscoSecure Installation Does Not Update the Sybase Database," page xxiii for details.

b. Manually complete the database upgrade procedure by changing to the CiscoSecure *$BASEDIR*/utils/bin directory and running the CSdbTool utility. Enter:
```
./CSdbTool upgrade
```

c. Remove the CiscoSecure binary files again. Enter:
```
pkgrm CSCEacs
```

d. Restart the CiscoSecure installation. Enter:
```
pkgadd -d /cdrom/csus_23 CSCEacs
```

Even though the database upgrade is now complete, running the installation procedure again ensures that all other necessary installation tasks will be carried out. Because the CiscoSecure ACS database upgrade is already complete, this portion of the installation will now be skipped.

Step 9 (Optional) After installation, if you saved your old CSU.cfg file as described in step 3, you can cut and paste your old settings from your old CSU.cfg file to the new CSU.cfg file to restore your original ACS debug level, TACACS+ NAS configurations, and supported authentication methods settings. See the section "Server Control File" in the chapter "Tuning CiscoSecure ACS Performance and Configuration" in the *CiscoSecure ACS 2.3 for UNIX User Guide* for a listing of CSU.cfg settings.

Alternatively, you can simply reenter these settings through the new CiscoSecure ACS AAA General and AAA NAS web pages.

Caution Do not copy the old CSU.cfg file over the new CSU.cfg file. The new CSU.cfg file contains important new settings specific to CiscoSecure ACS 2.3 for UNIX.

Step 10 (Optional) After installation, if you saved your old DefaultProfile file as described in Step 4, you can use the CiscoSecure ACS 2.3 CSImport utility to import your old unknown_user default profile settings into your new ACS installation. Enter:

$BASEDIR`/CSimport -c -p /hold_dir -s DefaultProfile`

where:

$BASEDIR is the directory where you installed CiscoSecure ACS.

hold_dir is the holding directory where you stored the old DefaultProfile file.

Note After you successfully upgrade to CiscoSecure ACS 2.3 for UNIX, you can activate the optional DSM module. Obtain the *CiscoSecure ACS Distributed Session Manager Option* product to license and enable the DSM module. See "Activating the DSM Module on an Existing CiscoSecure ACS 2.3," page xviii for details.

Upgrading CiscoSecure at Sites with a Non-Updatable Replicated Database

If you are attempting to upgrade from CiscoSecure 2.x in an existing replication environment and your environment includes non-updatable sites, when you upgrade the CiscoSecure software on such sites, you will receive an error message at the end of the upgrade process stating that the installation failed. This occurs because the CiscoSecure tables that were set up for replication cannot be written to except by the replication process.

The workaround for this problem is to make sure that you have successfully upgraded CiscoSecure on your Master Definition site. Ignore the error message received on the non-updatable site(s). When you replicate, the replication process will update these tables from the Master site.

Activating the DSM Module on an Existing CiscoSecure ACS 2.3

Activating the DSM Module on an Existing CiscoSecure ACS 2.3

If you are using the product labeled *CiscoSecure ACS Distributed Session Manager Option* (CSU-DSM) to enable the Distributed Session Manager module on an already existing CiscoSecure ACS 2.3 for UNIX installation, you do not need to run the installation program:

Step 1 Confirm that a Sybase or Oracle RDBMS site has been set up for your CiscoSecure ACSes prior to the last CiscoSecure ACS installation as described in "Setting Up an Oracle Database for CiscoSecure," page xix or in "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii.

Step 2 If you have not already done so, follow instructions in the document labeled *Requires Immediate Attention: License Keys for CiscoSecure ACS* to obtain the special 28-character software license keys required to enable the DSM module.

Step 3 From any workstation with a web connection to CiscoSecure ACS, open your web browser and log in to the CiscoSecure Administrator web site as **superuser**.

Note If you do not have access to the CiscoSecure Administrator web pages, you can manually edit the CiscoSecure CSU.cfg file to specify the new software license key. See "Editing CSU.cfg to Specify a CiscoSecure Software License Key," page xxxi.

Step 4 Locate the CiscoSecure License Key field in the AAA General web page, enter the special 28-character software license key, and click **Re-Initialize**.

Step 5 Locate the Max Sessions Enabled field in the AAA General web page and select the **Distributed** option to enable the Distributed Session Manager features on this ACS.

Step 6 Stop and restart CiscoSecure ACS for this setting to take effect:

- Log in as [Root] to the Ultra 1 workstation where you installed CiscoSecure ACS. To stop the ACS enter:

  # /etc/rc0.d/K80CiscoSecure

- To restart CiscoSecure ACS, enter:

  # /etc/rc2.d/S80CiscoSecure

Step 7 Confirm that Oracle or Sybase database replication is set up and enabled between your CiscoSecure database sites. For details, see the chapter "Setting up Database Replication Among CiscoSecure ACSes" in the *CiscoSecure ACS 2.3 for UNIX User Guide*.

Step 8 Confirm that AAA accounting functions are enabled on all client NASes. For details, see the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "CiscoSecure ACS Accounting."

Setting Up an Oracle Database for CiscoSecure

Setting Up an Oracle Database for CiscoSecure

Note If you are installing and supporting the per user, per group, and per VPDN session limitation features of the optional CiscoSecure Distributed Session Manager feature, you must configure your Oracle databases for database replication.

Oracle software is not bundled with CiscoSecure ACS. Therefore the CiscoSecure installation does not install or configure the Oracle product, create an Oracle database, or create a database user.

Note If you intend to set up CiscoSecure with Oracle database replication, Cisco recommends that you read the PDF document *Using CiscoSecure with Oracle's Distributed Database Feature* (filename csbsdoc.pdf) before you install the Oracle or CiscoSecure software. This document is located in the *$BASEDIR*/FastAdmin/docs directory of the CiscoSecure distribution CD-ROM. It provides an easy-to-understand, start-to-finish, screen-by-screen configuration example of setting up Oracle database replication to work with CiscoSecure.

Oracle Setup Requirements Prior to CiscoSecure Installation

If you intend to use an Oracle database with CiscoSecure ACS, make sure the Oracle database meets the following requirements before starting the CiscoSecure installation:

- Oracle version should be 7.3.2, 7.3.3, 7.3.4 or 8.0.x.

  Note If you intend to support Oracle database replication, Oracle version 7.3.3, 7.3.4, or 8.0x must be installed. Additionally, Oracle 7.3.3 and 7.3.4 require the Symmetric Replication Option and Distributed Database Option packages installed to support database replication. Oracle 8.0.x does not require these packages.

- The following Oracle products should be installed with the Oracle server (minimum):
  - Oracle 7 or Oracle 8 server
  - SQL*Net Version 2 or higher
  - Oracle TCP/IP protocol adapter
- The following Oracle products should be installed where CiscoSecure ACS will be installed (minimum):
  - SQL*Net Version 2 or higher—Module on the CiscoSecure server must be from Oracle 7.3.4 or higher
  - Oracle TCP/IP protocol adapter—Module on the CiscoSecure server must be from Oracle 7.3.4 or higher

  Note To upgrade to the above modules from a lower version, run the Oracle installation program, select the upgrade option, and select to upgrade the client versions of these modules.

- Make sure the Oracle server and **tnslsnr** processes are loaded and running before installing CiscoSecure ACS.

- CiscoSecure ACS requires an Oracle user database account setup prior to the CiscoSecure installation:
  - This user account must have a privilege to create/drop tables. (Connect and Resource privilege).
  - This user account should also have Select privilege on two of Oracle's system views: sys.dba_free_space and sys.dba_users.
  - The Oracle tablespace where the account belongs should have at least 200 MB of data space, 100 MB of rollback tablespace, and 50 MB of temporary tablespace available.

Oracle Information Required During CiscoSecure Installation

CiscoSecure ACS installation prompts require the following information concerning your Oracle installation:

- TNS name—Name for the Oracle server. It should be defined in Oracle's tnsnames.ora file.
- Oracle user—Database account (not Solaris account) which has Resource privilege.
- Oracle user's password.
- Oracle home—Absolute pathname of the directory where the Oracle product is installed. This should be the same as the ORACLE_HOME environment variable that is defined when Oracle is installed. Do not confuse this directory with the home directory of the Solaris user account for Oracle, such as /home/oracle.
- Connections—Specifies how many connections CiscoSecure ACS can make to the Oracle server. CiscoSecure ACS will make that number of connections when it starts up.

Oracle Database Replication Setup Following CiscoSecure Installation

If you want to set up database replication among multiple CiscoSecure ACS sites, assign your Oracle database administrator (DBA) to do so after CiscoSecure installation is complete. See the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Setting up Database Replication among CiscoSecure ACSes" for details.

Caution Database replication setup requires database administrator (DBA) expertise. If you do not possess DBA experience, assign this task to someone who does.

Note If you are installing and supporting the per user, per group, and per VPDN session limitation features of the optional *CiscoSecure Distributed Session Manager* feature, you must configure your Oracle databases for database replication.

Note If you intend to set up CiscoSecure with Oracle database replication, Cisco recommends that you read the PDF document *Using CiscoSecure with Oracle's Distributed Database Feature* (filename csbsdoc.pdf) before you install the Oracle or CiscoSecure software. This document is located in the *$BASEDIR*/FastAdmin/docs directory of the CiscoSecure distribution CD-ROM. It provides an easy-to-understand, start-to-finish, screen-by-screen configuration example of setting up Oracle database replication to work with CiscoSecure.

Troubleshooting if the CiscoSecure Installation Fails to Access your Oracle Database

Check the following items on the Oracle database:

- SQL*Net connectivity:
  - Check if SQL*Net and TCP/IP protocol adapter are installed on the system where CiscoSecure ACS is being installed.
  - Using Oracle's tools such as SQL*Plus or **tnsping**, check if you can connect to the Oracle server using the TNS name, the database username, and the password.

  Note See Oracle's *Network Products Troubleshooting Guide* for help in determining the SQL*Net configuration problems.

- Check if Oracle's shared library exists.

  $ORACLE_HOME/lib/libclntsh.so.1.0

  If the shared library does not exist, then this points to an Oracle installation problem. The library is installed as part of SQL*Net.

Setting Up a Sybase Enterprise SQL Server for CiscoSecure

Setting Up a Sybase Enterprise SQL Server for CiscoSecure

If you intend to use a Sybase Enterprise database with CiscoSecure ACS, make sure the Sybase Enterprise SQL server meets the following requirements.

Sybase Setup Requirements Prior to CiscoSecure Installation

Before you install CiscoSecure:

- SQL server should be version 11.0.2 or higher. The SQL server could be on a local or a remote system. At the time of CiscoSecure ACS installation, the SQL server should be running.
- Sybase Open Client/C version 11.1 or higher should be installed and configured on the system where CiscoSecure ACS is installed. This includes proper configuration of the *$SYBASE*/interfaces file.
- Prior to the CiscoSecure installation, set up an SQL server login account that CiscoSecure can use to connect to the SQL server.
- Additionally, Cisco recommends that the customer create a separate database for CiscoSecure ACS and create a database login account as the owner of the database. The size of the database depends on the user/group profiles and accounting data expected.

Sybase Information Required During CiscoSecure Installation

CiscoSecure installation will prompt for the following information related to Sybase:

- Sybase install directory
- SQL server name—Name of SQL server defined in the *$SYBASE*/interfaces file
- Database user account and password
- Database to use with CiscoSecure ACS
- Number of database connections that CiscoSecure ACS can use

Sybase Database Replication Setup Following CiscoSecure Installation

If you want to set up database replication among multiple CiscoSecure ACS sites, assign your Sybase database administrator (DBA) to do so after CiscoSecure installation is complete. See the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Setting up Database Replication among CiscoSecure ACSes." for details.

Caution Database replication setup requires database administrator (DBA) expertise. If you do not possess DBA experience, assign this task to someone who does.

Note If you are installing and supporting the per user, per group, and per VPDN session limitation features of the *CiscoSecure ACS 2.3 for UNIX with DSM* package, you *must* configure your Sybase databases for database replication.

If CiscoSecure Installation Does Not Update the Sybase Database

The CiscoSecure installation might fail to update the Sybase Enterprise database for early CiscoSecure for UNIX 2.x versions. In such cases, the installation program will stop after the following series of prompts and messages:

```
alter table cs_password add primary key (profile_id, pwd_type)
*** SQLException caught ***
SQLState:
Message:  Line 1 Error 1920 Level 16 State 1
        A column in a primary key constraint's
        column list is not constrained to be not null,
        column name: 'profile_id'.
Vendor:   1920
Upgrading schema failed.
```

In such cases, you must use Sybase tools to manually update the Sybase database schema, then rerun the part of the CiscoSecure installation program that updates the CiscoSecure database schema.

Step 1 Start the Sybase SQL command tool, **isql**, and enter the following series of commands to update the database schema:

```
create table cs_password_new
(
profile_id                      int                 not null,
pwd_type                        varchar(32)         not null,
pwd_value                       varchar(255)        null    ,
pwd_from_date                   datetime            null    ,
pwd_until_date                  datetime            null    ,
pwd_opaque                      varchar(255)        null    ,
pwd_qualifier                   varchar(10)         null    ,
)
go

insert into cs_password_new (profile_id, pwd_type, pwd_value,
pwd_from_date,pwd_until_date, pwd_opaque, pwd_qualifier)
select profile_id, pwd_type, pwd_value, pwd_from_date, pwd_until_date,
pwd_opaque, pwd_qualifier from cs_password
go

drop table cs_password
go

sp_rename cs_password_new, cs_password
go
```

Step 2 Run the *$BASEDIR*/utils/bin CSdbTool utility to continue the CiscoSecure database upgrade. Enter:

```
CSdbTool upgrade
```

Accessing CiscoSecure ACS 2.3 for UNIX Documentation

Accessing CiscoSecure ACS 2.3 for UNIX Documentation

After you install the CiscoSecure ACS 2.3 for UNIX software, the following documentation is available to you in several formats and several locations:

- Printed documents included with the CiscoSecure ACS 2.3 for UNIX product package include:
  - *CiscoSecure ACS 2.3 for UNIX Installation Guide* (this publication)
  - *Requires Immediate Attention: Software License Keys*
- HTML documents at your installed CiscoSecure ACS Administrator web pages include:
  - *CiscoSecure ACS 2.3 for UNIX User Guide*
  - *CiscoSecure ACS 2.3 for UNIX Installation Guide* (this publication)
  - *Frequently Asked Questions*—A compilation of answers to frequently asked questions about CiscoSecure ACS features
  - *Profile Syntax Guide*—A reference outline of CiscoSecure profile syntax and some common profile examples
  - readme or release notes—Any late-breaking information will be included in one of these files.

  To access—While running the CiscoSecure Administrator web pages, click **Help**.

  If you are *not* running the CiscoSecure ACS Administrator web pages, you can access the *CiscoSecure ACS 2.3 for UNIX User Guide* directly at:

  http://*acs_server***:9090/docs/csuxug23/index.htm**

  where *acs_server* is the host name (or the FQDN, if it is different from the host name) of the server where you installed CiscoSecure ACS. You can also substitute the server's IP address.
- Online help includes descriptions of individual fields in the CiscoSecure ACS Administrator web-based interface.

  To access—While running the CiscoSecure ACS Administrator web pages, you can access HTML help for an individual field by clicking on that field name.
- HTML documents at the Cisco corporate web site. The documents relevant to CiscoSecure ACS 2.3 for UNIX include:
  - *CiscoSecure ACS 2.3 for UNIX User Guide*
  - *CiscoSecure ACS 2.3 for UNIX Installation Guide* (this publication)

  Note The documents at this site are likely to be the most recently updated documents available for CiscoSecure ACS.

  To access—Use your web browser to view the documents at:

  http://www.cisco.com/univercd/cc/td/doc/product/access/acs_soft
- PDF documents at the installed CiscoSecure ACS Administrator web pages include:
  - *CiscoSecure ACS 2.3 for UNIX User Guide*

  PDF documents are readable with the Adobe Acrobat Reader, with full search capabilities and hypertext table of contents and index. They are printable with full hard copy formatting and available on your installed CiscoSecure ACS.

Installing without a CD-ROM

To access—While running the CiscoSecure ACS Administrator web pages, click **Help**, click **User Guide** and then click the **PDF** icon on the Contents page of the *CiscoSecure ACS 2.3 for UNIX User Guide*. You need Adobe Acrobat Reader installed on your system. Free copies of the Acrobat Reader can be downloaded from the Adobe web site:

http://www.adobe.com

Installing without a CD-ROM

If you do *not* have a CD-ROM drive attached to the Ultra 1 workstation where you want to install CiscoSecure ACS, download the installation software from the Cisco web site and run the installation program as follows:

Note To take the steps described in this section, you must have a valid SmartNet account. If you do not have a SmartNet account, contact your authorized Cisco Systems support representative for instructions.

Step 1 Make sure the Ultra 1 workstation where you want to install CiscoSecure ACS has at least 256 MB of available disk space.

Step 2 Go to the CiscoSecure Software Planner URL:

http://wwwin.cisco.com/cmc/cc/cisco/mkt/access/secure/
http://www.cisco.com/univercd/cc/td/doc/product/access/acs_soft/cs_unx/acsu235/instl235.htm

You are prompted for a username and password in order to access Cisco Connection Online (CCO).

Step 3 Using your SmartNet account, log in to CCO, specifying your username and password as prompted.

Step 4 Click **Download CiscoSecure Software**. The CiscoSecure Server Software Images page appears.

Step 5 Click the button beside the applicable version of CiscoSecure Solaris. If you agree to the terms of the software agreement, click **Execute**. You are prompted to specify the location from which to transfer the software image.

Step 6 Click the location of the CCO server that is closest to your target CiscoSecure server. You are prompted again for your CCO password.

Step 7 Enter your CCO password. A file is copied to your home directory.

Step 8 Uncompress the CiscoSecure ACS software package by entering the following command at the UNIX prompt:

uncompress CSCEacs-2.3.*x*.*x*.solaris.pkg.Z

Step 9 Translate the package file by entering the following command at the UNIX prompt:

pkgtrans CSCEacs-2.3.*x*.*x*.solaris.pkg /tmp

The following output displays:

```
The following packages are available:
1  CSCEacs-2.3.x.x CiscoSecure Access Control Software
(sun4) x.x
Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

Step 10 Enter **1**.

The download operation is now complete.

Step 11 Obtain your server license key and answer the preinstallation questions according to the instructions in the section "Basic Installation Procedures," page iv.

Note Do *not* enter the **pkgadd -d/cdrom/csus_23 CSCEacs** string to start the installation program.

Step 12 To start the installation program, enter:

```
pkgadd -d /tmp CSCEacs
```

Manually Enabling Profile Cache Updating

Profile cache updating must be enabled for CiscoSecure ACS servers whose CiscoSecure profile databases are modified directly by Oracle or Sybase database replication implementations or by third-party applications.

In the case of Oracle or Sybase database replication, you enable profile cache updating in the process of implementing the replication.

If you are using third-party applications that directly modify the CiscoSecure ACS profile data, use the following procedure to enable profile cache updating following the normal CiscoSecure installation.

Note For profile cache updating to work, the database user account used by the third-party application must be *different* from the user account that you specified when you originally installed and configured the Oracle or Sybase engines for CiscoSecure ACS.

Step 1 After completing CiscoSecure ACS installation on your UNIX host, change to the CiscoSecure *$BASEDIR*/utils/bin directory and run the CSdbTool utility. Enter:

```
./CSdbTool cache_trigger
```

This installs triggers in the CiscoSecure ACS database tables that insert the changes in a special log table, cs_trans_log, whenever a third-party program alters any profile data. These changes are periodically incorporated into the profile cache.

Step 2 In the CSConfig.ini file, make sure the following parameters are set:

```
[ProfileCaching]
EnableProfileCaching = ON
;polling period in minutes for cs_trans_log table
DBPollinterval = number_of_minutes
```

where *number_of_minutes* is the time in minutes that the customer wants between profile cache updates. This interval should match the intervals at which database replication or third-party applications directly modify the ACS profile data. For example, if database replication is configured to take place every 15 minutes, then the *number_of_minutes* for DBPollinterval should also be set to 15.

The default value is 30 minutes.

CiscoSecure System Description

The CiscoSecure ACS 2.3 for UNIX software provides authentication, authorization, and accounting services on users dialing in to the network through TACACS+ or RADIUS based network access servers (NASes).

Basic CiscoSecure Components

Basic network components that interact with CiscoSecure ACS are shown in Figure 1.

Figure 1 CiscoSecure and Network Components

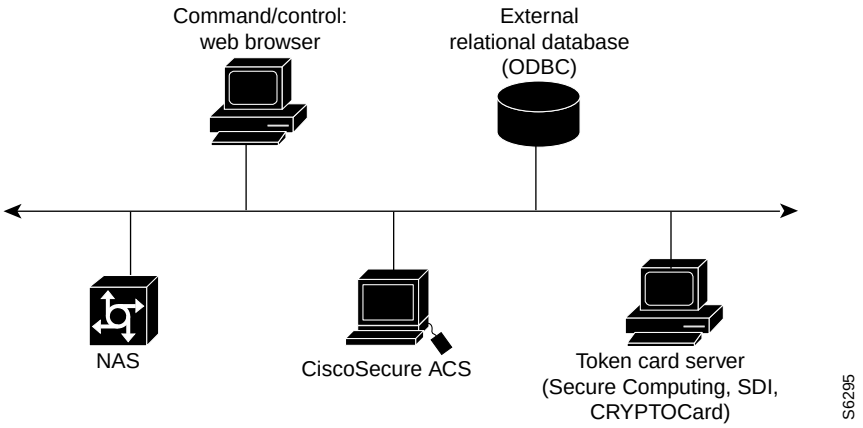


Table 3 Basic CiscoSecure Components

Node	Description
Network access server (NAS)	The NASes provide the ports (through which remote users can dial in to the network), forward login requests to CiscoSecure ACS, and carry out authentication and authorization instructions from CiscoSecure ACS. A single CiscoSecure ACS can provide authentication, authorization, and accounting services to multiple NASes.
CiscoSecure Access Control Server (ACS)	CiscoSecure ACS receives the login request from the NAS, pulls the profile from the user making the login request from the RDBMS and based on the profile: • Transmits authentication and authorization instructions back to the NAS • Transmits accounting records back to the RDBMS If a token server is in use, CiscoSecure ACS transmits the login request to the token server for authentication.

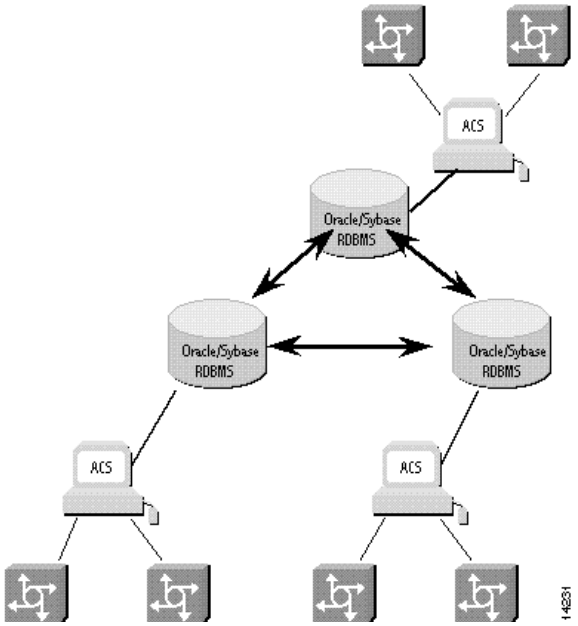
Table 3 Basic CiscoSecure Components

Node	Description
CiscoSecure Profile database	The profile database contains the authentication, authorization, and accounting information for each of your users and groups. Each CiscoSecure ACS requires a relational database management system (RDBMS) engine installed to store, retrieve, and maintain this information. CiscoSecure supplies an SQLAnywhere database engine with the CiscoSecure ACS for UNIX product; however, if you intend to support profile databases larger than 5,000 users or a network of CiscoSecure ACSes using a common replicated profile database for authentication, authorization, and accounting, you must purchase and preinstall Oracle Enterprise or Sybase Enterprise RDBMS to support your RDBMS.
CiscoSecure workstation console	The CiscoSecure workstation console provides web-based pages through which the CiscoSecure profile database can be administered by the CiscoSecure system administrator or group administrator.
Token server	An optional third-party server for executing authentication of token card users entering one-time passwords (OTPs). CiscoSecure ACS can be configured to forward login requests from token card users for authentication by the token server.

Multiple CiscoSecure ACS Installation

Networks that provide access at multiple locations or support large numbers of users (for example, nationwide ISP networks that provide local dial-in login across the nation) are best supported by multiple ACSes with an RDBMS configured to replicate changes to any local CiscoSecure profile database to all other CiscoSecure profile database sites in the network.

Figure 2 Multiple ACSes and Replicated Profile Databases



In order to support database replication among your ACSes, you need to purchase and preinstall Oracle Enterprise or Sybase Enterprise RDBMS software at each ACS database site where you want replication of the CiscoSecure profile database to be carried out.

The per user, per group, or per VPDN maximum session limit feature of the *CiscoSecure ACS 2.3 for UNIX with DSM* package requires you to configure profile database replication.

Distributed Session Manager Features

With the CiscoSecure ACS 2.3 for UNIX product, you can purchase a special software license key to enable the Distributed Session Manager (DSM). When installed and enabled, the DSM feature allows access to special DSM-specific web pages that enable the CiscoSecure system administrator to limit and enforce, on a very fine-grained basis, the number of concurrent sessions allowed per user, per group, or per VPDN either on a network-wide basis, or through a particular "point-of-presence" group of NASes.

Note If you do *not* purchase the DSM-enabling software license key, you can *still* limit the number of concurrent sessions on a *per user* basis. See the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "Limiting and Tracking Sessions Per User, Group, or VPDN" for descriptions of maximum session limits supported by the DSM-enabled and the non-DSM-enabled CiscoSecure ACS 2.3 for UNIX packages.

Summary of DSM Installation and Post-Installation Requirements

Before you attempt to configure DSM max sessions control, make sure that you have implemented the following CiscoSecure installation and post-installation requirements:

- You need to have preinstalled Oracle Enterprise version 7.3.3, 7.3.4 or 8.0.x or Sybase Enterprise version 11.0.2 or higher as the RDBMS for the CiscoSecure ACS profiles. For details see "Setting Up an Oracle Database for CiscoSecure," page xix or "Setting Up a Sybase Enterprise SQL Server for CiscoSecure," page xxii.
- You need to have enabled the DSM module using the appropriate product:
  - If you were installing CiscoSecure ACS for the first time, you need to have installed the package titled *CiscoSecure ACS 2.3 for UNIX Distributed Session Manager.* See "Basic Installation Procedures," page iv.
  - If you wanted to upgrade a previous version of CiscoSecure ACS 2.x for UNIX to support the DSM module, you needed to first upgrade to CiscoSecure ACS 2.3 for UNIX. Then you could use the *CiscoSecure ACS Distributed Manager Option* product to activate the DSM module. See "Upgrading from CiscoSecure ACS 2.x to 2.3," page xiv.
  - If you wanted to activate the DSM module at an existing CiscoSecure ACS 2.3 for UNIX site without a licensed DSM module, you needed to use the package titled *CiscoSecure ACS Distributed Session Manager Option*. See "Activating the DSM Module on an Existing CiscoSecure ACS 2.3," page xviii.

Editing Configuration Files to Enable or Disable the DSM Module

- After installation or upgrade, you needed to log in to the CiscoSecure Administrator web site located the Max Sessions Enabled field in the AAA General web page, select **Distributed** to activate the DSM module, and restart the CiscoSecure ACS server.
- You needed to confirm that the AAA accounting functions are enabled on the client NASes. See the *CiscoSecure ACS 2.3 for UNIX User Guide* chapter "CiscoSecure ACS Accounting."
- If your network is serviced by more than one CiscoSecure ACS installation, database replication must be configured and enabled between the CiscoSecure profile RDBMS sites. See the chapter "Setting up Database Replication among CiscoSecure ACSes" in the *CiscoSecure ACS 2.3 for UNIX User Guide*.

Caution Database replication setup requires database administrator (DBA) expertise. If you do not possess DBA experience, assign this task to someone who does.

Editing Configuration Files to Enable or Disable the DSM Module

Cisco strongly recommends using the Max Sessions Enabled field in the CiscoSecure Administrator AAA General web page to enable or disable the Distributed Session Manager or other supported types of max sessions control.

Alternatively, if you do not have access to a web browser, you can enable or disable max sessions control by editing the CSU.cfg and CSConfig.ini configuration files.

Step 1 In the *$BASEDIR*/config directory of your ACS server, edit your CSU.cfg and CSConfig.ini files as specified in Table 4 to enable the DSM or other supported types of max sessions control.

Caution If you edit the CSU.cfg and CSConfig.ini files, make sure that when you *enable* one type of max sessions control that you also *disable* all other types of max sessions control. Enabling the settings for one type of max sessions control in the table below *without* disabling the settings for the other types of max sessions control can cause extremely slow authentication performance and out-of-memory errors.

Table 4 Editing Configuration Files to Enable or Disable the DSM

Type of Max Sessions	*CSU.cfg Required Settings*	*CSConfig.ini Required Settings*
None (all max sessions control disabled)	• config_maxsessions_enable= **0** • config_distmaxsessions_enable=**0** Disables AAA server and DSM max sessions control	• ProcessInMemoryMaxSessionInfo = **disable** • ArchiveMaxSessionInfoToDB = **disable** Disables DBServer-based max sessions control.
Distributed Session[1] Manager (DSM)	• config_maxsessions_enable= **0** • config_distmaxsessions_enable=**1** Disables AAA server-based max sessions control and enable the DSM	• ProcessInMemoryMaxSessionInfo = **disable** • ArchiveMaxSessionInfoToDB = **disable** Disables DBServer-based max sessions control

Editing CSU.cfg to Specify a CiscoSecure Software License Key

Table 4 Editing Configuration Files to Enable or Disable the DSM

Type of Max Sessions	CSU.cfg Required Settings	CSConfig.ini Required Settings
DBServer-based Max Sessions control (default setting)	• config_maxsessions_enable= **0** • config_distmaxsessions_enable=**0** Disables AAA server-based max sessions control and the DSM	• ProcessInMemoryMaxSessionInfo = **enable** • ArchiveMaxSessionInfoToDB = **enable** Enables DBServer-based max sessions control
AAA Server-based Max Sessions control	• config_maxsessions_enable= **1** • config_distmaxsessions_enable=**0** Enables AAA server-based max sessions control and disables the DSM	• ProcessInMemoryMaxSessionInfo = **disable** • ArchiveMaxSessionInfoToDB = **disable** Disables DBServer-based max sessions control

1. DSM-based session control can only take effect if the optional Distributed Session Manager module has been licensed for this installation of CiscoSecure ACS 2.3 for UNIX.

Step 2 After making the above settings, stop and restart CiscoSecure ACS to make sure that all the above settings take effect:

- Log in as [Root] to the Ultra 1 workstation where you installed CiscoSecure ACS. To stop CiscoSecure ACS, enter:

  # /etc/rc0.d/K80CiscoSecure

- To restart CiscoSecure ACS, enter:

  # /etc/rc2.d/S80CiscoSecure

Note All forms of max sessions control require that the AAA accounting functions be enabled in the client NASes.

Editing CSU.cfg to Specify a CiscoSecure Software License Key

If you want to specify a software license key after installing CiscoSecure ACS, or if you want to modify the software license key for an existing CiscoSecure ACS 2.3 UNIX installation because you have obtained a new key to enable the optional Distributed Session Manager module, you can use the CiscoSecure License Key field in the CiscoSecure Administrator AAA General web page.

Alternatively, you can manually edit the config_license_key variable in the CSU.cfg file:

Step 1 Open the file *$BASEDIR*/config/CSU.cfg.

$BASEDIR is the install directory for CiscoSecure that you specified at the time of installation. If you used the default install location, the file is located at /ciscosecure/config/CSU.cfg.

Step 2 Find the config_license_key variable and enter or modify the value for software license key number. For example:

```
LIST config_license_key = {"a9505ad08a77f927afa4"};
```

Step 3 After changing the software license key, stop and restart CiscoSecure ACS for your changes to the CSU.cfg file to take effect.

- Log in as [Root] to the Ultra 1 workstation where you installed CiscoSecure ACS. To stop CiscoSecure ACS, enter:

  # /etc/rc0.d/K80CiscoSecure

- To restart CiscoSecure ACS, enter:

  # /etc/rc2.d/S80CiscoSecure

Obtaining Documentation

World Wide Web

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